Supplement to Wireless & Electrical Trader, 17 September 1960

"TRADER" SERVICE SHEET

1465

ALBA 22 and 33

Transistor A.M. Receivers

DESIGNED to operate from two 4.5V batteries, the Alba 22 is a 7-transistor portable receiver covering the waveband ranges 185-566m (M.W.) and 1,110-1,875m (L.W.). It is fitted with a printed circuit panel, a high impedance (25Ω) speaker, and a ferrite rod aerial. A socket is provided for the connection of an external aerial.

Model 33 is a table receiver employing a similar chassis to model 22, but the external aerial socket is omitted.

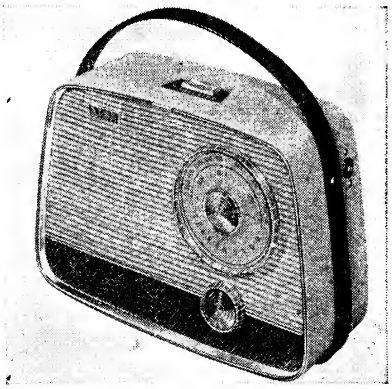
Release dates and original prices: Model 22, March, 1960, £14 14s 3d; *Model 33, August,* 1960, £14 6s 3d. *Purchase tax extra.*

TRANSISTOR ANALYSIS

Transistor voltages given in the table below are those derived from the manufacturers' information. They were measured on the 10V and 2.5V ranges of a model 8 Avometer, chassis being the positive connection in every case. There was no signal input.

Transistor	Emitter (V)	Base (V)	Collector (V)
TR1 (X1) OC44	1·27	1·2	8·6
TR2 (X2) OC45	0·75	0·9	7·7
TR3 (X3) OC45	1·15	1·25	8·85
TR4 (X4) OC81D	1·45	1·6	8·5
TR5 (X5) OC81†	4·5	4·55	9·0
TR6 (X6) OC81†	—	0·15	4·5

†*Matched pair.*



The Alba 22 transistor portable. Model 33 is similar but without the strap handle.

Component Values and Locations

Resistors			***Capacitors***			C30	—	B1
R1	56kΩ	C1	C1	0·04μF	B1	C31	—	B1
R2	10kΩ	B1	C2	—	B2			
R3	390Ω	B1	C3	350pF	B1	***Coils****		
R4	3·9kΩ	B1	C4	100pF	B1	L1	1·0	C1
R5	68kΩ	C2	C5	0·04μF	B1	L2	6·0	A1
R6	1kΩ	B2	C6	400pF	C2	L3	—	C1
R7	680Ω	B2	C7	0·01μF	B1	L4	1·0	A1
R8	6·8kΩ	B2	C8	8·2pF	B1	L5	—	C1
R9	22kΩ	B2	C9	—	B2	L6	—	C1
R10	4·7kΩ	B3	C10	400pF	C2	L7	2·0	C1
R11	8·2kΩ	C2	C11	0·04μF	B2	L8	4·0	C2
R12	3·3kΩ	B3	C12	0·04μF	C2	L9	—	C2
R13	1kΩ	B3	C13	8μF	C3	L10	4·0	B2
R14	470Ω	C3	C14	10pF	B2	L11	—	B2
R15	—	†	C15	400pF	B2	L12	4·0	C3
R16	27kΩ	B3	C16	400pF	B2	L13	—	C3
R17	330Ω	A3	C17	0·04μF	B3	L14	25·0	—
R18	150Ω	B2	C18	22pF	B3			
R19	10kΩ	A3	C19	250μF	B3	***Miscellaneous****		
R20	10Ω	B3	C20	250pF	C3	T1 (a)	180·0	A2
R21	330Ω	B3	C21	0·04μF	B3	T1 (b)	50·0	A2
R22	2·2kΩ	A1	C22	0·02μF	C3	T1 (c)	50·0	A2
R23	75Ω	A1	C23	0·02μF	C3	SCR1	OA79	B2
R24	2·2kΩ	A2	C24	8μF	A3	SCR2	OA70	C3
R25	75Ω	B2	C25	100μF	A3	S1-S6	—	C1
R26	630Ω	A2	C26	100μF	A1	S7, S8	—	B3
R27	—	†	C27	8·2pF	B1			
R28	—	‡	C28	75pF	§			
R29	5kΩ	B3	C29	10pF	§			

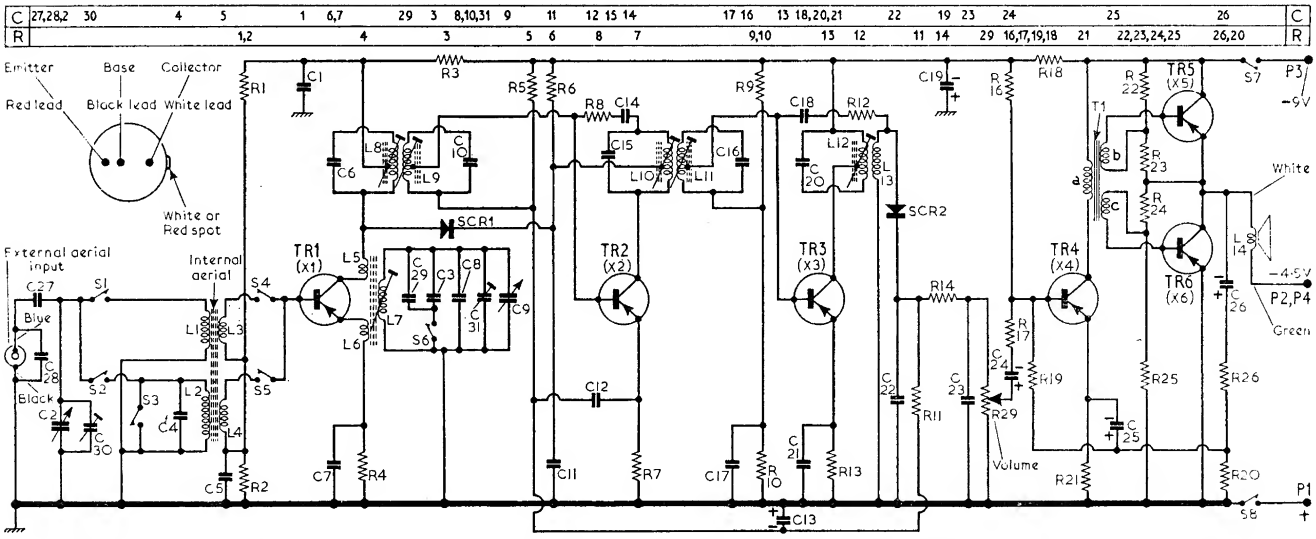
**Approximate D.C. resistance in ohms.* †*No component.* §*Printed circuit side of panel in B1.*

CIRCUIT DESCRIPTION

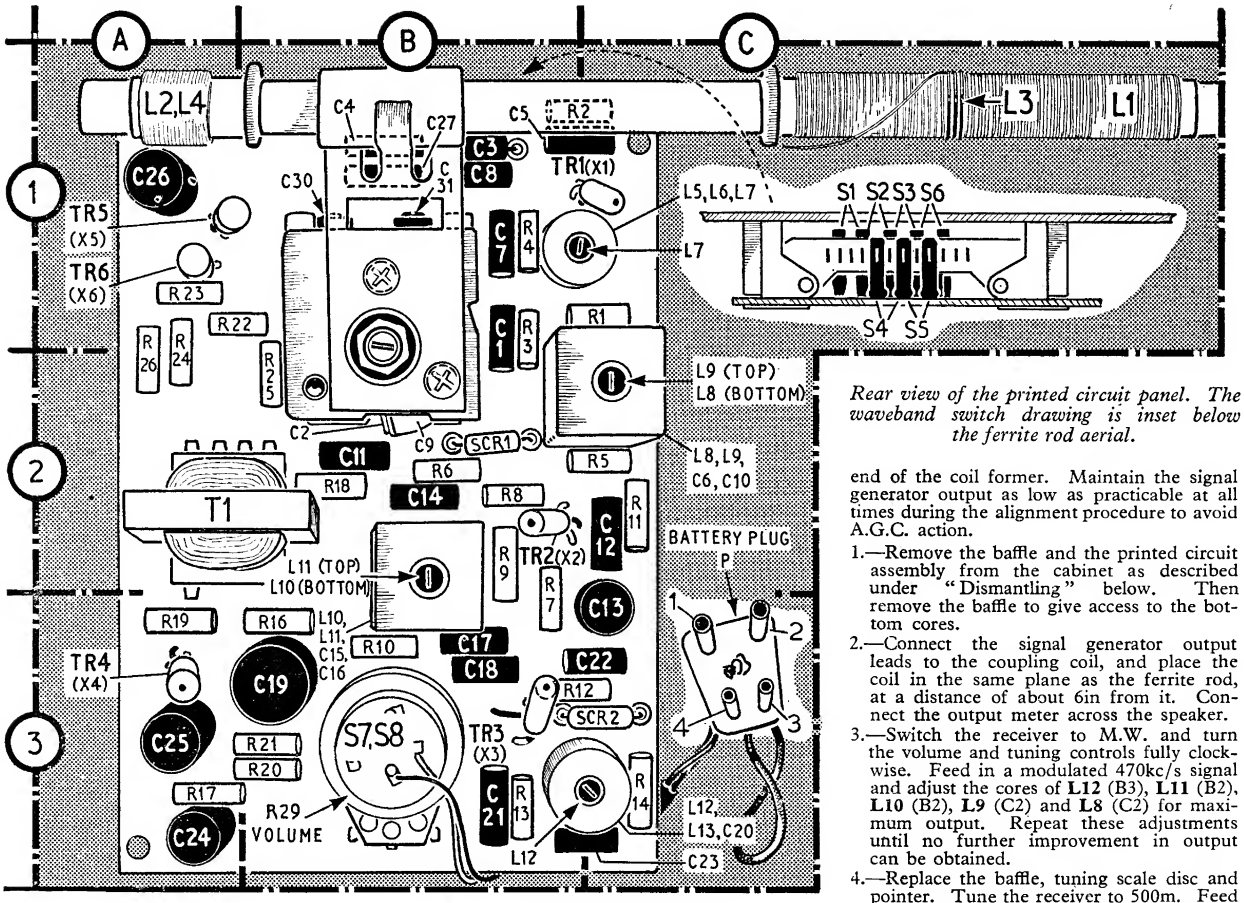
Separate ferrite rod aerial coils **L1** (M.W.) and **L2** (L.W.) are switched across the R.F. section of the tuning gang (**C2**) by **S1** and **S2**, respectively. **L2** and **C4** are short-circuited by **S3** on M.W. to prevent spurious responses due to inductive coupling between the aerial coils. Trimming by **C30** on M.W., additional capacitance being provided by **C4** on L.W. Provision is made for the connection of an external aerial, which is coupled to the tuned circuits via **C27** and **C28** to prevent the detuning effect due to aerial capacitance.

The aerial circuits are coupled by low impedance windings **L3** (M.W.) and **L4** (L.W.) to the base of **TR1 (XI)**, which operates as

(*Continued col. 1 overleaf*)



Circuit diagram of the Alba 22 and 33 receivers, except that in the 33 the external aerial socket is omitted, but not the capacitors **C27** *and* **C28**. **SCR1** *conducts if* **TR2** *collector voltage becomes more negative than that of* **TR1**, *damping* **L8, L9** *and supplementing A.G.C. action.*



Rear view of the printed circuit panel. The waveband switch drawing is inset below the ferrite rod aerial.

Circuit Description—*continued*

a self-oscillating frequency changer. Local oscillation is produced by positive feedback between the collector and emitter via **L5, L6** and **L7**. Oscillator coil **L7** is tuned by **C8, C31** and **C9** on M.W., and in addition by **C29** and **C3** on L.W. Base bias is provided by the potential divider **R1, R2.**

Intermediate frequency 470 kc/s

The audio signal from the detector is developed across the combined diode load and volume control **R29** and passed via electrolytic capacitor **C24,** and **R17** to the base of **TR4 (X4)**, which operates as an A.F. driver.

A.G.C. bias is obtained from the D.C. component of the rectified signal developed across **R29,** which is fed to the base circuit of **TR2 (X2)** via decoupling components **R11, C13.** The A.G.C. action is supplemented by the variable damping effect of the damping diode **SCR1** on the primary winding of I.F. transformer **L8, L9**. The anode of the diode is connected to the steady potential at the junction of **L5, L8,** while its cathode is connected to the variable potential at the junction of **R6, C11,** in the collector circuit of **TR2 (X2).** Under weak signal conditions the potential drop across **R6** provides the diode with a reverse bias so that its impedance is high enough to have a negligible damping effect on **L8.** As the signal strength increases, however, the normal A.G.C. action reduces the collector current of **TR2 (X2),** and hence the voltage drop across **R6.** This causes **SCR1** to conduct, thus increasing its damping effect on **L8** and reducing the gain of the receiver.

The output of **TR4 (X4)** is coupled via phase-splitting transformer **T1** to the bases of the class B push-pull output transistors **TR5 (X5), TR6 (X6).**

GENERAL NOTES

Batteries.—The batteries recommended by the manufacturer are two Ever Ready PP11's, or equivalents, rated at 4.5V each.

Switches.—The waveband switches **S1-S6** are ganged in a 2-position slide-type unit. The unit is not shown in our illustration of the chassis, as from this point of view it is hidden by the ferrite rod assembly. However, a sketch of the unit is shown in location reference C1, where it is drawn as seen from the top of the chassis panel as indicated by the arrow. **S1, S3** and **S4** are closed on M.W.; and **S2, S5** and **S6** are closed on L.W.

Transistors.—The transistor collector lead is the one nearest to the white or red spot painted on the side of the transistor case. In addition, the manufacturers have colour coded the sleeving of the three connecting leads as follows: red, emitter; black, base; and white, collector. A diagram of the coding is shown inset with the circuit diagram overleaf.

In the event of replacement of either of the output transistors **TR5, TR6** (Mullard OC81's) being necessary, *both* transistors must be replaced with a matched pair.

CIRCUIT ALIGNMENT

Equipment Required.—A signal generator, modulated 30 per cent at 400c/s; an A.C. voltmeter for use as an output meter; and a coupling coil, which may be made up by winding 14 turns of 18SWG wire on a $\frac{7}{8}$in former, spacing the turns to occupy a winding length of $1\frac{1}{8}$in.

If two peaks are obtained when adjusting the iron-dust tuning cores, the correct one is the first peak obtained from the adjusting end of the coil former. Maintain the signal generator output as low as practicable at all times during the alignment procedure to avoid A.G.C. action.

1.—Remove the baffle and the printed circuit assembly from the cabinet as described under "Dismantling" below. Then remove the baffle to give access to the bottom cores.

2.—Connect the signal generator output leads to the coupling coil, and place the coil in the same plane as the ferrite rod, at a distance of about 6in from it. Connect the output meter across the speaker.

3.—Switch the receiver to M.W. and turn the volume and tuning controls fully clockwise. Feed in a modulated 470kc/s signal and adjust the cores of **L12** (B3), **L11** (B2), **L10** (B2), **L9** (C2) and **L8** (C2) for maximum output. Repeat these adjustments until no further improvement in output can be obtained.

4.—Replace the baffle, tuning scale disc and pointer. Tune the receiver to 500m. Feed in 600kc/s signal and adjust the core of the oscillator coil **L7** (C1) for maximum output. Then slide the former of the M.W. aerial coil **L1** (C1) along the ferrite rod for maximum output.

5.—Tune the receiver to 200m. Feed in a 1,500kc/s signal and adjust **C31** and **C30** (location reference B1) for maximum output.

6.—Switch the receiver to L.W. and tune it to 1,433m. Feed in a 210kc/s signal and slide the former of **L2** (A1) along the ferrite rod for maximum output. Finally, seal the formers of **L1** and **L2** to the ferrite rod to prevent them from moving.

DISMANTLING

Removing Chassis.—Place the receiver face down and remove the back cover (two screws);

remove the elastic band which secures the ferrite rod to the cabinet.

remove the pins from the waveband escutcheon and carefully disengage the switch actuating rod from the hole in the control knob;

disconnect the leads from the external aerial socket; remove four woodscrews securing the baffle to the cabinet shell, which can then be lifted off.

Removing Chassis from Baffle.—Pull off the control knobs and the tuning pointer;

remove the two pins from the tuning scale; remove the scale and the Phillips head screw behind it;

remove the Phillips head screw adjacent to the volume control spindle;

slide the chassis towards the top of the baffle, and lift it off.

Printed in England by Cornwall Press Ltd., Paris Garden, London, S.E.1.